

# CANADIAN GEOTECHNICAL JOURNAL, VOLUME 8, 1971

## AUTHOR INDEX

- Adams, J. I. and Radhakrishna, H. S. Uplift resistance of augered footings in fissured clay, 452-462.
- Andersland, O. B. *See* Warder, D. L.
- Barden, L. and Proctor, D. C. The drained strength of granular material, 372-383.
- Barden, L. *See* Sides, G.
- Bauer, G. E. Observations on some basal failures in sheeted excavations: Discussion, 346-348.
- Bellier, Jean. The behavior of tied-back retaining walls: Discussion, 600-601.
- Bhaskaran, R. The vane test in organic soils: Discussion, 613.
- Bigham, R. E. The effectiveness of sand drains: Discussion, 142.
- Birdsall, R. O. *See* Poskitt, T. J.
- Bozozuk, M. Land subsidence in built-up marshland, 592-595.
- Broms, B. B. *See* Rehman, S.-E.
- Brzezinski, L. S. A review of the 1924 Kenogami landslide, 1-6.
- Burn, K. N. *See* Mitchell, R. J.
- Chagnon, J.-Y. *See* Tavenas, F.
- Coldwell, K. L. *See* Conlon, R. J.
- Conlon, R. J., Tanner, R. G., and Coldwell, Keith L. The geotechnical design of the Townline road-rail tunnel, 299-314.
- Crawford, C. B. and Sutherland, J. G. The Empress Hotel, Victoria, British Columbia. Sixty-five years of foundation settlements, 77-93.
- Crawford, C. B. and Johnston, G. H. Construction on permafrost, 236-251.
- Culley, R. W. Effect of freeze-thaw cycling on stress-strain characteristics and volume change of a till subjected to repetitive loading, 359-371.
- Danys, J. V. Lightpiers on friction piles in deep soft marine clay, 434-445.
- DeJong, J. and Harris, M. C. Settlements of two multistorey buildings in Edmonton, 217-235.
- DeJong, J. and Morgenstern, N. R. The influence of structural rigidity on the foundation loads of the CN tower, Edmonton, 527-537.
- DeLory, F. A. and Lai, H. W. Variation in undrained shearing strength by semi-confined tests, 538-545.
- Duguid, D. R., Forbes, D. J., Gordon, J. L., and Simmons, O. K. The Slurry Trench cut-off for the Duncan dam, 94-108.
- Eden, W. J. and Mitchell, R. J. The mechanics of landslides in Leda clay: Reply, 148-149.
- Eden, W. J., Fletcher, E. B., and Mitchell, R. J. South Nation River landslide, 446-451.
- Eisbacher, G. H. Natural slope failure, northeastern Skeena Mountains, 384-390.
- Fletcher, E. B. *See* Eden, W. J.
- Forbes, D. J. *See* Duguid, D. R.
- Gamble, Bruce R. Stabilization of fine sands using polyvinyl acetate, 336-340.
- Gill, A. S. Soil grinding mill: Discussion, 350.
- Gold, L. W. Use of ice covers for transportation, 170-181.
- Gold, L. W. *See* Penner, E.
- Gold, L. W. and Krausz, A. S. Investigation of the mechanical properties of St. Lawrence River ice, 163-169.
- Gordon, J. L. *See* Duguid, D. R.
- Graham, J. Calculation of passive pressure in sand, 566-578.
- Grice, R. H. Geological data handling in urban areas, 134-138.
- Hanna, T. H. and Matallana, G. A. The behavior of tied-back retaining walls: Reply, 602-603.
- Harris, M. C. *See* DeJong, J.
- Hawson, H. H. *See* Quigley, R. M.
- Hollingshead, G. W. Stress distribution in rock anchors, 588-591.

- Hollingshead, G. W. and Raymond, G. P.** Prediction of undrained movements caused by embankments on muskeg, 23-35.
- Hollingshead, G. W. and Raymond, G. P.** Erratum: Prediction of undrained movements caused by embankments on muskeg, 357.
- Horvath, R. G.** See Quigley, R. M.
- Hwang, C. T., Morgenstern, N. R., and Murray, D. W.** On solutions of plane strain consolidation problems by finite element methods, 109-118.
- Jamal, A. K.** Triaxial extension tests on hollow cylinder sand specimens, 119-133.
- Johnston, G. W.** See Crawford, C. B.
- Keene, Philip.** The Empress Hotel, Victoria, British Columbia. Sixty-five years of foundation settlements: Discussion, 610.
- Krausz, A. S.** See Gold, L. W.
- Kwan, D.** Observations of the failure of a vertical cut in clay at Welland, Ontario, 283-298.
- Lal, H.** See DeLory, F. A.
- Ladanyi, B.** Bearing capacity of piles driven into rock by: S. E. Rehnman and B. B. Broms, 610.
- La Rochelle, P.** See Tavenas, F.
- Lo, K. Y.** The geotechnical design of the Townline road-rail tunnel: Discussion, 604-606.
- Lo, K. Y.** See Milligan, V.
- Lo, K. Y.** See Roy, M.
- Loiselle, Andre, Massiera, M., and Sainani, U. R.** A study of the cementation bonds of the sensitive clays of the Outardes river region, 479-498.
- Lojkasek, M. J.** See Raymond, G. P.
- Massiera, M.** See Loiselle, A.
- Matallana, G. A.** See Hanna, T. H.
- Matich, M. A. J.** See Quigley, R. M.
- Matich, M. A. J. and Stermac, A. G.** Settlement performance of the Burlington Bay skyway, 252-271.
- Meneley, W. A.** See Morrison, B.
- Michel, B. and Ramseier, R. O.** Classification of river and lake ice, 36-45.
- Milligan, V. and Lo, K. Y.** Observations on some basal failures in sheeted excavations: Reply, 349.
- Mitchell, R. J. and Burn, K. N.** Electronic measurement of changes in the volume of pore water during testing of soil samples, 341-345.
- Mitchell, R. J.** See Eden, W. J.
- Morgenstern, N. R.** See Hwang, C. T.
- Morgenstern, N. R.** See DeJong, J.
- Morgenstern, N. R. and Nixon, J. F.** One-dimensional consolidation of thawing soils, 403-432.
- Morrison, B. and Meneley, W. A.** A bubbler-manometer water level sensing and recording system, 425-433.
- Murray, D. W.** See Hwang, C. T.
- Nixon, J. F.** See Morgenstern, N. R.
- Northwood, R. P. and Sangrey, D. A.** The vane test in organic soils, 69-76.
- Northwood, R. P. and Sangrey, D. A.** The vane test in organic soils: Discussion, 614.
- Novak, Milos.** Vibration of soils and foundations, 354.
- Osler, J. C.** See Yong, R. N.
- Paul, M. J.** The mechanics of landslides in Leda clay: Discussion, 143-147.
- Paul, M. J.** See Sangrey, D. A.
- Penner, E.** Heave and heaving pressures in frozen soils: Discussion, 499-500.
- Penner, E. and Gold, L. W.** Transfer of heaving forces by adfreezing to columns and foundation walls in frost-susceptible soils, 514-526.
- Poskitt, T. J. and Birdsall, R. O.** A theoretical and experimental investigation of mildly nonlinear consolidation behavior in saturated soil, 182-216.
- Proctor, D. C.** See Barden, L.
- Quigley, R. M.** The geotechnical design of the Townline road-rail tunnel: Discussion, 609-610.
- Quigley, R. M., Horvath, R. G., Matich, M. A. J., and Hawson, H. H.** Swelling clay in two slope failures at Toronto, Canada, 417-424.
- Radhakrishna, H. S.** See Adams, J. L.
- Ramseier, R. O.** See Michel, B.
- Rao, G. V.** See Sridharan, A.
- Raymond, G. P.** See Hollingshead, G. W.
- Raymond, G. P.** See Hollingshead, G. W.
- Raymond, G. P., Townsend, D. L., and Lojkasek, M. J.** The effect of sampling on the undrained soil properties of a Leda soil, 613.

- Rehman, S.-E. and Broms, Bengt B.** Bearing capacity of piles driven into rock, 151-162.
- Roy, M. and Lo, K. Y.** Effect of end restraint on high pressure tests of granular materials, 579-587.
- Salmari, U. R.** See Loiselle, A.
- Sangrey, D. A.** See Northwood, R. P.
- Sangrey, D. A.** See Northwood, R. P.
- Sangrey, D. A. and Paul, M. J.** A regional study of landsliding near Ottawa, 315-335.
- Scott, J. S.** Regional engineering geology of Czechoslovak Carpathians: Book Review, 335.
- Scott, J. S.** The geotechnical design of the townline road-rail tunnel: Discussion, 607-608.
- Scott, J. S.** Regional geology and landslides in the marine clay deposits of Eastern Canada: Discussion, 139-141.
- Sides, G. and Barden, L.** The microstructure of dispersed and flocculated samples of kaolinite, illite, and montmorillonite, 391-399.
- Simmons, O. K.** See Duguid, D. R.
- Sowa, V. A.** Erratum: Pulling capacity of concrete cast *in situ* bored piles, 358.
- Sridharan, A. and Rao, G. V.** Effective stress theory of shrinkage phenomena, 503-513.
- Stermac, A. G.** See Matich, M. A. J.
- Tanner, R. G.** See Conlon, R. J.
- Tavenas, F. A.** Contrôle du roc de fondation de pieux forés à haute capacité, 400-416.
- Tavenas, F. A.** Load tests results on friction piles in sand, 7-22.
- Tavenas, F. A.** Les applications de la similitude physique aux problèmes de la mécanique des sols, par J. D. Weber: Book Review, 615-616.
- Tavenas, F. A., Chagnon, J.-Y., and La Rochelle, P.** The Saint-Jean-Vianney landslide: Observations and eye-accounts, 463-478.
- Thomson, S.** Analysis of a failed slope, 596-599.
- Townsend, D. L.** See Raymond, G. P.
- Walker, L. K.** The Empress Hotel, Victoria, British Columbia. Sixty-five years of foundation settlements: Discussion, 501.
- Warder, D. L. and Andersland, O. B.** Soil-ice behavior in a model retaining structure, 46-68.
- Wilson, N. E.** A text book of soil mechanics: Book Review, 356.
- Yong, R. N. and Osler, J. C.** Heave and heaving pressures in frozen soils, 272-282.
- Young, F. D.** Soil grinding mill: Reply, 353.

## SUBJECT INDEX<sup>1</sup>

---

### A. General

01. *Foundation Soil and Rock Engineering—Scope*  
A text book of soil mechanics: Book Review. Wilson, N. E., 356.  
Regional engineering geology of Czechoslovak Carpathians: Book Review. Scott, J. S., 355.
04. *Textbooks, Handbooks, and Geotechnical Periodicals*  
A textbook of soil mechanics: Book Review. Wilson, N. E., 356.  
Vibrations of soils and foundations. Novak, M., 354.  
Les applications de la similitude physique aux problèmes de la mécanique des sols: Book Review. Tavenas, F. A., 615.

### B. Engineering Geology

00. *General*  
Regional engineering geology of Czechoslovak Carpathians: Book Review. Scott, J. S., 355.
03. *Mass Movements and Subsidence*  
A regional study of landsliding near Ottawa. Sangrey, D. A. and Paul, M. J., 315.  
A Review of the 1924 Kenogami Landslide. Brzezinski, L. S., 1.  
Land subsidence in built-up marshland. Bozozuk, M., 592.  
Regional geology and landslides in the marine clay deposits of eastern Canada: Discussion. Scott, J. S., 139.  
South Nation River landslide, 16 May 1971. Eden, W. J., Fletcher, E. B., and Mitchell, R. J., 446.  
The Saint-Jean-Vianney landslide: Observations and eye-witnesses accounts. Tavenas, F., Chagnon, J.-Y., and LaRoche, P., 463.
05. *Permafrost and Frozen Ground*<sup>1</sup>  
Construction on permafrost. Crawford, C. B. and Johnston, G. H., 236.
07. *Structural Geology*  
Natural slope failure, northeastern Skeena Mountains. Eisbacher, G. H., 384.
08. *Extraterrestrial Geology*  
Vibration of soils and foundations. Novak, M., 354.
10. *Mineralogy and Petrography*  
Swelling clay in two slope failures at Toronto, Canada. Quigley, R. M., Matich, M. A. J., Horvath, R. J., and Hawson, H. H., 417.  
The microstructure of dispersed and flocculated samples of kaolinite, illite, and montmorillonite. Sides, G. and Barden, L. 391.

### C. Site Investigations

06. *Sampling, Handling of Samples*  
The effect of sampling on the undrained soil properties of a Leda soil. Raymond, G. F., Townsend, D. L., and Lojkasek, M. J., 546.
07. *Measurement of Field Conditions*  
A bubbler-manometer water level sensing and recording system. Morrison, B. and Meneley, W. A., 425.

---

<sup>1</sup>Based on the International Geotechnical Classification System (IGC) approved in 1969 by the International Society for Soil Mechanics and Foundation Engineering. Permission to use this classification system is gratefully acknowledged.

**D. Soil Properties: Laboratory and Field Determinations****00. General**

Soil grinding mill: Discussion. Gill, A. S., 350.

Soil grinding mill: Reply. Young, F. D., 353.

**02. Physico-chemical Properties**

A study of the cementation bonds of the sensitive clays of the Outardes river region.

Loiselle, A., Massiera, M., and Sainani, U. R., 479.

Effective stress theory of shrinkage phenomena. Sridharan, A. and Rao, G., 503.

Swelling clay in two slope failures at Toronto, Canada. Quigley, R. M., Matich, M. A. J., Horvath, R. J., and Hawson, H. H., 417.

**03. Composition, Structure, and Density**

The microstructure of dispersed and flocculated samples of kaolinite, illite, and montmorillonite. Sides, G. and Barden, L., 391.

**05. Compressibility**

A study of the cementation bonds of the sensitive clays of the Outardes river region.

Loiselle, A., Massiera, M., and Sainani, U. R., 479.

A theoretical and experimental investigation of mildly nonlinear consolidation behavior in saturated soil. Poskitt, T. J. and Birdsall, R. O., 182.

Effect of freeze-thaw cycling on stress-strain characteristics and volume change of a till subjected to repetitive loading. Culley, R. W., 359.

Prediction of Undrained Movements caused by Embankments on Muskeg. Hollingshead, G. W. and Raymond, G. P., 23.

Prediction of undrained movements caused by embankments on muskeg: Erratum. Hollingshead, G. W. and Raymond, G. P., 357.

**06. Shear-deformation and Strength Properties**

A study of the cementation bonds of the sensitive clays of the Outardes river region.

Loiselle, A., Massiera, M., and Sainai, U. R., 479.

Contrôle du roc de fondation de pieux forés à haute capacité. Tavenas, F., 400.

Effect of end restraint on high pressure tests of granular materials. Roy, M. and Lo, K. Y., 579.

Effect of freeze-thaw cycling on stress-strain characteristics and volume change of a till subjected to repetitive loading. Culley, R. W., 359.

Effective stress theory of shrinking phenomena. Sridharan, A. and Rao, G. V., 503.

Electronic measurement of changes in the volume of pore water during testing of soil samples. Mitchell, R. J. and Burn, K. N., 341.

The drained strength of granular material. Barden, L. and Proctor, D. C., 372.

The effect of sampling on the undrained soil properties of a Leda soil. Raymond, G. P., Townsend, D. L., and Lojasek, M. J., 546.

The mechanics of landslides in leda clay: Discussion. Paul, M. J., 143.

The mechanics of Landslides in Leda Clay: Reply to M. J. Paul. Eden, W. J. and Mitchell, R. J., 148.

The vane test in organic soils. Northwood, R. P. and Sangrey, D. A., 69.

The vane test in organic soils: Discussion. Bhaskaran, R., 613.

The vane test in organic soils: Closure to Discussion. Northwood, R. P. and Sangrey, D. A., 614.

Triaxial extension tests on hollow cylinder sand specimens. Jamal, A. K., 119.

Uplift resistance of augered footings in fissured clay. Adams, J. I. and Radhakrishna, H. S., 452.

Variation in undrained shearing strength by semi-confined tests. DeLory, F. A. and Lai, H. W., 538.

**08. Thermal Properties**

Effect of freeze-thaw cycling on stress-strain characteristics and volume change of a till subjected to repetitive loading. Culley, R. W., 359.

Heave and heaving pressures in frozen soils. Yong, R. N. and Osler, J. C., 272.

Heave and heaving pressures in frozen soils: Discussion. Penner, E., 499.

**10. Properties of Soil-Additive Mixtures**

Stabilization of fine sands using polyvinyl acetate. Gamble, B. R., 336.

**E. Analysis of Soil-Engineering Problems****01. In Situ Stresses caused by Gravity and Applied Loads and Excavations**

Effective stress theory of shrinking phenomena. Sridharan, A. and Rao, G. V., 503.

The influence of structural rigidity on the foundation loads of the CN Tower, Edmonton. DeJong, J. and Morgenstern, N. R., 527.

02. *Deformation and Settlement Problems*

A theoretical and experimental investigation of mildly nonlinear consolidation behavior in saturated soil. Poskitt, T. J. and Birdsall, R. O., 182.

Prediction of undrained movements caused by embankments on muskeg: Erratum. Hollingshead, G. W. and Raymond, G. P., 357.

One-dimensional consolidation of thawing soils. Morgenstern, N. R. and Nixon, J. F., 558.

On solutions of plane strain consolidation problems by finite element methods. Hwang, C. T., Morgenstern, N. R., and Murray, D. W., 109.

Prediction of undrained movements caused by embankments on muskeg. Hollingshead, G. W. and Raymond, G. P., 23.

Settlements of two multistorey buildings in Edmonton. DeJong, J. and Harris, M. C., 217.

The Empress Hotel, Victoria, British Columbia, Sixty-five years of foundation settlements: Discussion. Keene, P., 611.

03. *Bearing Capacity of Soils*

Uplift resistance of augered footings in fissured clay. Adams, J. I. and Radhakrishna, H. S., 452.

04. *Bearing Capacity of Piles*

Bearing capacity of piles driven into rock. Rehnman, S.-E. and Broms, B. B., 151.

Bearing capacity of piles driven into rock: Discussion. Ladanyi, B., 611.

Load Tests Results on Friction Piles in Sand. Tavenas, F. A., 7.

Pulling capacity of concrete cast *in situ* bored piles: Erratum. Sowa, V. A., 358.

05. *Earth Pressure Problems*

Calculation of passive pressure in sand. Graham, J., 566.

Soil-ice Behavior in a Model Retaining Structure. Warder, D. L. and Andersland, O. B., 46.

The behavior of tied-back retaining walls: Discussion. Bellier, J., 600.

The behavior of tied-back retaining walls: Reply. Hanna, T. H. and Matallana, T. A., 602.

06. *Stability of Slopes, Cuts and Excavations*

Analysis of a failed slope. Thomson, S., 596.

A regional study of landsliding near Ottawa. Sangrey, D. A. and Paul, M. J., 315.

A review of the 1924 Kenogami landslide. Brzezinski, L. S., 1.

Observations of the failure of a vertical cut in clay at Welland, Ontario. Kwan, D., 283.

Observations on some basal failures in sheeted excavations: Discussion. Bauer, G. E., 346.

Observations on some basal failures in sheeted excavations: Reply. Lo, K. Y. and Milligan, V., 349.

Regional geology and landslides in the marine clay deposits in Eastern Canada. Scott, J. S., 139.

Swelling clay in two slope failures at Toronto, Canada. Quigley, R. M., Matich, M. A. J., and Horvath, R. J., 417.

The geotechnical design of the Townline road-rail tunnel. Conlon, R. J., Tanner, R. G., and Coldwell, K. L., 299.

The geotechnical design of the Townline road-rail tunnel: Discussion. Lo, K. Y., 604.

The geotechnical design of the Townline road-rail tunnel: Discussion. Quigley, R. M., 609.

The geotechnical design of the Townline road-rail tunnel: Discussion. Scott, J. S., 607.

The Mechanics of Landslides in Leda Clay: Discussion. Paul, M. J., 143.

The Mechanics of landslides in leda clay: Reply. Paul, M. J. and Mitchell, R. J., 148.

07. *Seepage and other Hydraulic Problems*

Observations on some basal failures in sheeted excavations: Discussion. Bauer, G. E., 346.

Observations on some basal failures in sheeted excavations: Reply. Lo, K. Y. and Milligan, V., 349.

The effectiveness of sand drains: Discussion. Bigham, R. E., 142.

09. *Frost Action and Heat-Transfer Problems*

Construction on permafrost. Crawford, C. B. and Johnston, G. H., 236.

Effect of freeze-thaw cycling on stress-strain characteristics and volume change of a till subjected to repetitive loading. Culley, R. W., 359.



- Heave and heaving pressures in frozen soils. Yong, R. N. and Osler, J. C., 272.  
 Heave and heaving pressures in frozen soils: Discussion. Penner, E., 499.  
 One-dimension consolidation of thawing soils. Morgenstern, N. R. and Nixon, J. F., 558.  
 Transfer of heaving forces by adfreezing to columns and foundation walls in frost-susceptible soils. Penner, E. and Gold, L. W., 514.

### F. Rock Properties: Laboratory and Field Determinations

#### 02. *Physico-chemical Properties*

- Settlement performance of the Burlington Bay Skyway. Matich, M. A. J. and Stermac, A. G., 252.

### G. Analysis of Rock Engineering Problems

#### 03. *Bearing Capacity of Rock*

- Bearing capacity of piles driven into rock: Discussion. Ladanyi, B., 611.

#### 04. *Stability of Slopes, Excavations, and Openings*

- Natural slope failure, northeastern Skeena Mountains. Eisbacher, G. H., 384.

#### 01. *In Situ Stresses caused by Gravity, Tectonics, Applied Loads, and Excavations*

- Stress distribution in rock anchors. Hollingshead, G. W., 588.

### H. Design Construction and Behavior of Engineering Works

#### 01. *Foundations of Structures*

- Contrôle du roc de fondation de pieux forés à haute capacité. Tavenas, F., 400.  
 Light piers on friction piles in deep soft marine clays. Danys, J. V., 434.  
 Settlement performance of the Burlington Bay Skyway. Matich, M. A. J. and Stermac, A. G., 252.  
 Settlements of two multistorey buildings in Edmonton. DeJong, J. and Harris, M. C., 217.  
 The Empress Hotel, Victoria, British Columbia. Sixty-five years of Foundation Settlements. Crawford, C. B. and Sutherland, J. G., 77.  
 The Empress Hotel, Victoria, British Columbia. Sixty-five years of foundation settlements: Discussion. Crawford, C. B. and Sutherland, J. G., 501.  
 The Empress Hotel, Victoria, British Columbia. Sixty-five years of foundation settlements: Discussion. Keene, P., 610.  
 The influence of structural rigidity on the foundation loads of the CN tower, Edmonton. DeJong, J. and Morgenstern, N. R., 527.  
 Transfer of heaving forces by adfreezing to columns and foundation walls in frost-susceptible soils. Penner, E. and Gold, L. W., 514.

#### 02. *Retaining Structures and Cutoff Walls*

- Observations on some basal failures in sheeted excavations: Discussion. Bauer, G. E., 346.  
 Observations on some basal failures in sheeted excavations: Reply. Lo, K. Y. and Milligan, V., 349.  
 The slurry trench cut-off for the duncan dam. Duguid, D. R., Forbes, D. J., Gordon, J. L., and Simmons, O. K., 94.  
 The behavior of tied-back retaining walls: Discussion. Bellier, J., 600.  
 The behavior of tied-back retaining walls: Reply. Hanna, T. H. and Matallana, T. A., 602.

#### 03. *Unsupported Excavations*

- Observations of the failure of a vertical cut in clay at Welland, Ontario. Kwan, D., 283.  
 The geotechnical design of the Townline road-rail tunnel. Conlon, R. J., Tanner, R. G., and Coldwell, K. L., 299.  
 The geotechnical design of the Townline road-rail tunnel: Discussion. Lo, K. Y., 604.  
 The geotechnical design of the Townline road-rail tunnel: Discussion. Quigley, R. M., 609.

#### 04. *Earthworks, Embankments, Fills, and Dams*

- The Empress Hotel, Victoria, British Columbia. Sixty-five years of foundation settlements. Crawford, C. B. and Sutherland, J. B., 77.  
 The Empress Hotel, Victoria, British Columbia. Sixty-five years of foundation settlements: Discussion. Walker, L. K., 501.  
 The Empress Hotel, Victoria, British Columbia. Sixty-five years of foundation settlements: Discussion. Keene, P., 610.

**05. Underground Structures**

- The geotechnical design of the townline road-rail tunnel. Conlon, R. J., Tanner, R. G., and Coldwell, K. L., 299.  
The geotechnical design of the Townline road-rail tunnel: Discussion. Scott, J. S., 607.

**K. Construction Methods and Equipment  
Including Improvement of Soil and Rock Conditions****01. Dewatering and Drainage**

- The effectiveness of sand drains: Discussion. Bigham, R. E., 142.

**07. Piles and Pile Driving**

- Lightpiers on friction piles in deep soft marine clay. Danys, J. V., 434.

**08. Caissons and Deep Piers**

- Contrôle du roc de fondation de pieux forés à haute capacité. Tavenas, F., 400.

**10. Slurry-assisted Construction of Foundation and Cut-off Walls**

- The slurry trench cutoff for Duncan Dam. Duguid, D. R., Forbes, D. J., Gordon, J. L., and Simmons, O. K., 94.

**11. Anchorages, Tied-back Walls, Reinforcement, Linings and Other Supports of Soil and Rock**

- Uplift resistance of augered footings in fissured clay. Adams, J. I. and Radhakrishna, H. S., 452.

**S. Snow and Ice Mechanics and Engineering****01. Snow and Ice Cover**

- Classification of River and Lake Ice. Michel, B. and Ramseier, R. O., 36.  
Use of ice covers for transportation. Gold, L. W., 170.

**02. Properties of Snow and Ice**

- Investigation of the mechanical properties of St. Lawrence River ice. Gold, L. W. and Krausz, A. S., 163.

**03. Snow and Ice Engineering**

- Soil-ice behavior in a model retaining structure. Warder, D. L. and Andersland, O. B., 46.

**T. Related Disciplines****01. Pure Sciences**

- Geological data handling in urban areas. Grice, R. H., 134.

**02. Geological Sciences**

- Geological data handling in urban areas. Grice, R. H., 134.

**03. Agriculture and Pedology**

- Geological data handling in urban areas. Grice, R. H., 134.

**06. Civil Engineering**

- The influence of structural rigidity on the foundation loads of the CN tower, Edmonton. DeJong, J. and Morgenstern, N. R., 527.



# **CANADIAN GEOTECHNICAL JOURNAL**

---

## **REVUE CANADIENNE DE GÉOTECHNIQUE**

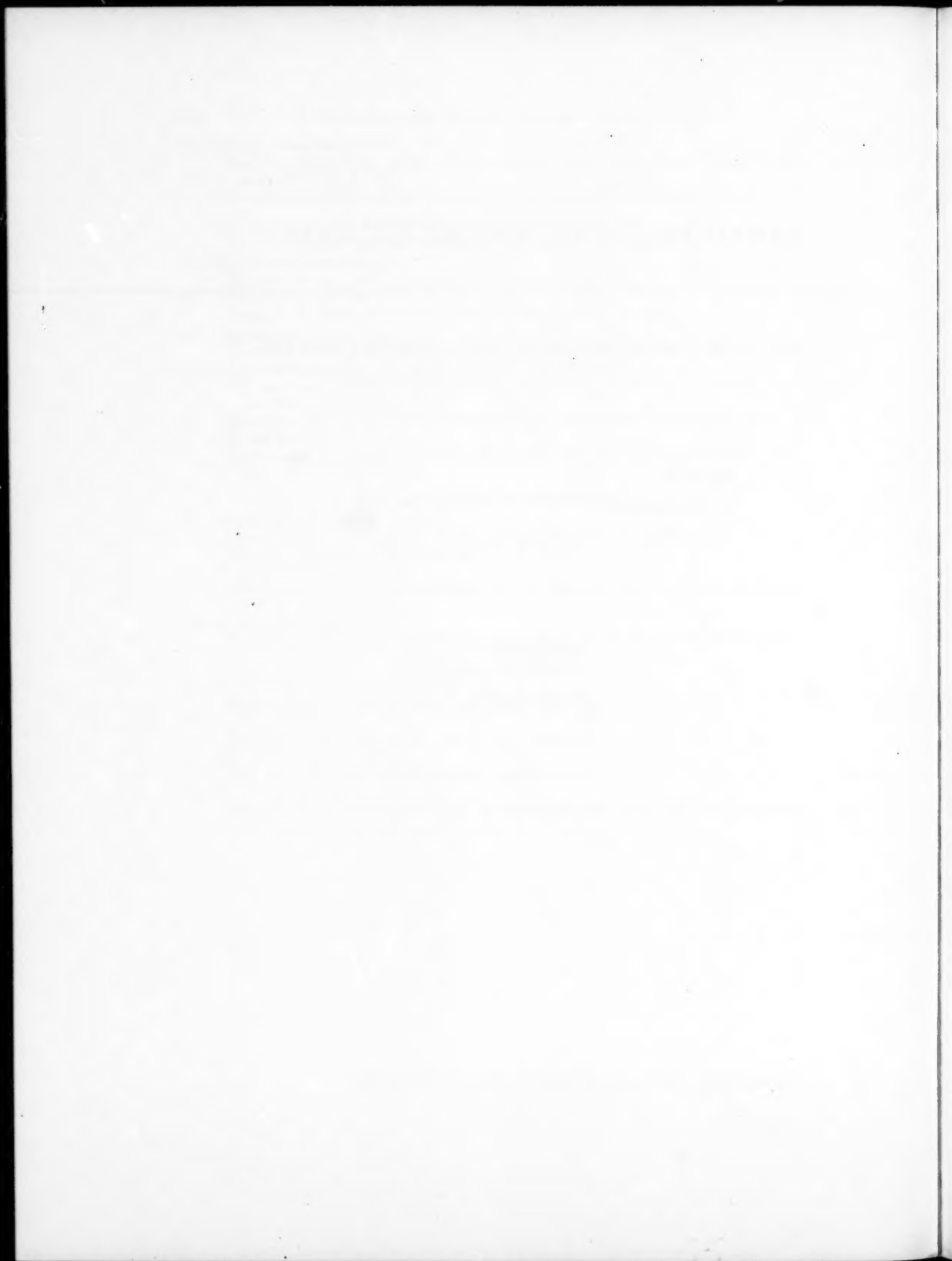
**EDITOR:**

**A. G. STERMAC**

### **CONTENTS**

**Volume 8, 1971**

**Published by The National Research Council of Canada**



## CONTENTS

### FEBRUARY

#### ARTICLES:

|   |     |
|---|-----|
| <b>L. S. Brzezinski</b> A Review of the 1924 Kenogami Landslide   | 1   |
| <b>François A. Tavenas</b> Load Tests Results on Friction Piles in Sand   | 7   |
| <b>Garry W. Hollingshead and Gerald P. Raymond</b> Prediction of Undrained Movements caused by Embankments on Muskeg                  | 23  |
| <b>B. Michel and R. O. Ramseler</b> Classification of River and Lake Ice  | 36  |
| <b>David L. Warder and O. B. Andersland</b> Soil-ice Behavior in a Model Retaining Structure  | 46  |
| <b>R. P. Northwood and D. A. Sangrey</b> The Van Test in Organic Soils  | 69  |
| <b>C. B. Crawford and J. G. Sutherland</b> The Empress Hotel, Victoria, British Columbia. Sixty-five Years of Foundation Settlements  | 77  |
| <b>D. R. Duguid, D. J. Forbes, J. L. Gordon, and O. K. Simons</b> The Slurry Trench Cut-off for the Duncan Dam                        | 94  |
| <b>C. T. Hwang, N. R. Morgenstern, and D. W. Murray</b> On Solutions of Plane Strain Consolidation Problems by Finite Element Methods | 109 |
| <b>A. K. Jamal</b> Triaxial Extension Tests on Hollow Cylinder Sand Specimens   | 119 |

#### TECHNICAL NOTES:

|  |     |
|--|-----|
| <b>R. H. Grice</b> Geological Data Handling in Urban Areas | 134 |
|--|-----|

#### DISCUSSIONS:

|  |     |
|--|-----|
| <b>J. S. Scott</b> Regional Geology and Landslides in the Marine Clay Deposits of Eastern Canada: Discussion | 139 |
| <b>Robert E. Bigham</b> On the Effectiveness of Sand Drains: Discussion                                      | 142 |
| <b>M. J. Paul</b> The Mechanics of Landslides in Leda Clay: Discussion                                       | 143 |
| <b>W. J. Eden and R. J. Mitchell</b> The Mechanics of Landslides in Leda Clay: Reply                         | 148 |

### MAY

#### ARTICLES:

|   |     |
|---|-----|
| <b>Sven-Erik Rehnman and Bengt B. Broms</b> Bearing capacity of piles driven into rock  | 151 |
| <b>L. W. Gold and A. S. Krausz</b> Investigation of the mechanical properties of St. Lawrence River ice   | 163 |
| <b>L. W. Gold</b> Use of ice covers for transportation  | 170 |
| <b>T. J. Poskitt and R. O. Birdsall</b> A theoretical and experimental investigation of mildly nonlinear consolidation behavior in saturated soil | 182 |
| <b>J. DeJong and M. C. Harris</b> Settlements of two multistory buildings in Edmonton   | 217 |
| <b>C. B. Crawford and G. H. Johnston</b> Construction on permafrost   | 236 |
| <b>M. A. J. Matich and A. G. Stermac</b> Settlement performance of the Burlington Bay Skyway  | 252 |
| <b>R. N. Yong and J. C. Osler</b> Heave and heaving pressures in frozen soils   | 272 |
| <b>D. Kwan</b> Observations of the failure of a vertical cut in clay at Welland, Ontario  | 283 |
| <b>Robert J. Conlon, Roy G. Tanner, and Keith L. Coldwell</b> The geotechnical design of the Townline road-rail tunnel                            | 299 |
| <b>D. A. Sangrey and M. J. Paul</b> A regional study of landsliding near Ottawa   | 315 |

#### TECHNICAL NOTES:

|   |     |
|---|-----|
| <b>Bruce R. Gamble</b> Stabilization of fine sands using polyvinyl acetate  | 336 |
| <b>R. J. Mitchell and K. N. Burn</b> Electronic measurement of changes in the volume of pore water during testing of soil samples | 341 |

#### DISCUSSIONS:

|   |     |
|---|-----|
| <b>G. E. Bauer</b> Observations on some basal failures in sheeted excavations: Discussion | 346 |
|---|-----|

|  |     |
|--|-----|
| <b>V. Milligan and K. Y. Lo</b> Observations on some basal failures in sheeted excavations:<br>Reply | 349 |
| <b>A. S. Gill</b> Soil grinding mill: Discussion   | 350 |
| <b>F. D. Young</b> Soil grinding mill: Reply   | 353 |

#### BOOK REVIEWS:

|   |     |
|---|-----|
| <b>Milos Novak</b> Vibration of soils and foundations                         | 354 |
| <b>John S. Scott</b> Regional engineering geology of Czechoslovak Carpathians | 355 |
| <b>Nyal E. Wilson</b> A text book of soil mechanics                           | 356 |

#### ERRATA:

|   |     |
|---|-----|
| <b>Garry W. Hollingshead and Gerald P. Raymond</b> Erratum: Prediction of undrained movements caused by embankments of muskeg | 357 |
| <b>V. A. Sowa</b> Errata: Pulling capacity of concrete cast <i>in situ</i> bored piles  | 358 |

#### AUGUST

##### ARTICLES:

|  |     |
|--|-----|
| <b>R. W. Culley</b> Effect of Freeze-Thaw Cycling on Stress-Strain Characteristics and Volume Change of a Till Subjected to Repetitive Loading   | 359 |
| <b>L. Barden and D. C. Proctor</b> The Drained Strength of Granular Material   | 372 |
| <b>G. H. Eisbacher</b> Natural Slope Failure, Northeastern Skeena Mountains  | 384 |
| <b>Geoffrey Sides and Laing Barden</b> The Microstructure of Dispersed and Flocculated Samples of Kaolinite, Illite, and Montmorillonite         | 391 |
| <b>F. Tavenas</b> Contrôle du roc de fondation de pieux forés à haute capacité   | 400 |
| <b>R. M. Quigley, M. A. J. Matich, R. G. Horvath, and H. H. Howson</b> Swelling Clay in Two Slope Failures at Toronto, Canada                    | 417 |
| <b>B. Morrison and W. A. Meneley</b> A Bubbler-Manometer Water Level Sensing and Recording System  | 425 |
| <b>J. V. Danys</b> Lightpiers on Friction Piles in Deep Soft Marine Clay   | 434 |
| <b>W. J. Eden, E. B. Fletcher, and R. J. Mitchell</b> South Nation River Landslide, 16 May 1971  | 446 |
| <b>J. I. Adams and H. S. Radharkrishna</b> Uplift Resistance of Augered Footings in Fissured Clay  | 452 |
| <b>F. Tavenas, J.-Y. Chagnon, and P. LaRochelle</b> The Saint-Jean-Vianney Landslide: Observations and Eyewitness Accounts                       | 463 |
| <b>André Loiselle, Michel Massiera, and Usha R. Sainani</b> A Study of the Cementation Bonds of the Sensitive Clays of the Outardes River Region | 479 |

##### DISCUSSIONS:

|   |     |
|---|-----|
| <b>E. Penner</b> Heave and Heaving Pressures in Frozen Soils: Discussion  | 499 |
| <b>L. K. Walker</b> The Empress Hotel, Victoria, British Columbia. Sixty-five Years of Foundation Settlements: Discussion | 501 |

#### NOVEMBER

##### PAPERS:

|  |     |
|--|-----|
| <b>A. Sridharan and G. V. Roa</b> Effective stress theory of shrinkage phenomena   | 503 |
| <b>E. Penners and L. W. Gold</b> Transfer of heaving forces by adfreezing to columns and foundation walls in frost-susceptible soils | 514 |
| <b>J. DeJong and N. R. Morgenstern</b> The influence of structural rigidity on the foundation loads of the C.N. Tower, Edmonton      | 527 |
| <b>F. A. DeLory and H. N. Lai</b> Variation in undrained shearing strength by semi-confined tests                                    | 538 |
| <b>G. P. Raymond, D. L. Townsend, and M. J. Lojkaček</b> The effect of sampling on the undrained soil properties of the Leda soil    | 546 |
| <b>N. R. Morgenstern and J. F. Nixon</b> One-dimensional consolidation of thawing soils  | 558 |
| <b>J. Graham</b> Calculation of passive pressure in sand   | 566 |

##### TECHNICAL NOTES:

|   |     |
|---|-----|
| <b>M. Roy and K. Y. Lo</b> Effect of end restraint on high pressure tests of granular materials | 579 |
| <b>G. W. Hollingshead</b> Stress distribution in rock anchors                                   | 588 |
| <b>M. Bozozuk</b> Land subsidence in built-up marshland   | 592 |
| <b>S. Thomson</b> Analysis of a failed slope  | 596 |

##### DISCUSSIONS:

|   |     |
|---|-----|
| <b>Jean Bellier</b> The behavior of tied-back retaining walls: Discussion               | 600 |
| <b>T. H. Hanna and G. A. Matallana</b> The behavior of tied-back retaining walls: Reply | 602 |

|   |     |
|---|-----|
| <b>K. Y. Lo</b> The geotechnical design of the townline road-rail tunnel: Discussion                                    | 604 |
| <b>J. S. Scott</b> The geotechnical design of the townline road-rail tunnel   | 607 |
| <b>R. M. Quigley</b> The geotechnical design of the townline road-rail tunnel: Discussion                               | 609 |
| <b>P. Keene</b> The Empress Hotel, Victoria, British Columbia. Sixty-five years of foundation settlements               | 610 |
| <b>B. Ladanyi</b> Bearing capacity of piles driven into rock by: S. E. Rennman and B. B. Broms                          | 611 |
| <b>R. Bhaskaran</b> Discussion: The vane test in organic soils, By: R. P. Northwood and D. A. Sangrey                   | 613 |
| <b>R. P. Northwood and D. A. Sangrey</b> The vane test in organic soils   | 614 |
| <b>BOOK REVIEW:</b>   |     |
| <b>F. A. Tavenas</b> Les applications de la similitude physique aux problèmes de la mécanique des sols. Par J. D. Weber | 615 |